



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,573	01/28/2005	Shigeo Yamaguchi	040894-7171	8882

9629 7590 04/13/2006

MORGAN LEWIS & BOCKIUS LLP
1111 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20004

EXAMINER

DIAMOND, ALAN D

ART UNIT	PAPER NUMBER
----------	--------------

1753

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

CM

Office Action Summary	Application No.		Applicant(s)	
	10/522,573		YAMAGUCHI ET AL.	
	Examiner		Art Unit	
	Alan Diamond		1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>01282005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 1, at lines 9-15, there are stray photocopy marks through the text. These photocopy marks should be removed. Furthermore, the Brief Description of the Drawings section at page 21, line 1 through page 22, line 10, is not in a proper location in the specification. The Brief Description of the Drawings section should be moved so that it starts at page 4, line 15, of the specification. Furthermore, throughout the specification, the term "oxinitride" should be changed to "oxynitride" so as to be consistent with how this term is used in the U.S. Appropriate correction is required.

Claim Objections

2. Claims 1-5 are objected to because of the following informalities: At line 1 in each of claims 1-5, the term "oxinitride" should be changed to "oxynitride" so as to be consistent with how this term is used in the U.S. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-5, 7, and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite because if the material is an "oxynitride", then the N in the formula (A) must be positively recited as being present. Thus, it is suggested that the

Art Unit: 1753

term "so that the element composition is an oxynitride" be inserted after "1.7" and before the comma at line 5. The same applies to dependent claims 2-5.

At line 2 in each of claims 7 and 8, the word "one" should be inserted after "least" so as to clearly point out what is intended.

Claim Rejections - 35 USC § 102/103

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6-10 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over O'Leary et al, "Electron transport in wurtzite indium nitride," J. Appl. Phys., 83(2), pages 826-829, January 15, 1998.

O'Leary et al teaches wurtzite indium nitride (see the entire document), which, it is the Examiner's position, has the claimed Seebeck coefficient and electrical resistivity, particularly in view of the fact that wurtzite indium nitride is within the scope of formula (B) in instant claim 6. Since O'Leary et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Art Unit: 1753

In addition, the instant Seebeck coefficient and electrical resistivity would obviously have been present once O'Leary et al's wurtzite indium nitride has been provided. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

8. Claims 6-9 and 11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamauchi (U.S. Patent 4,365,107).

Yamauchi teaches amorphous indium nitride (see the Table at cols. 3-4), which, it is the Examiner's position, has the claimed Seebeck coefficient and electrical resistivity, particularly in view of the fact that amorphous indium nitride is within the scope of formula (B) in instant claim 6. Since Yamauchi teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

In addition, the instant Seebeck coefficient and electrical resistivity would obviously have been present once Yamauchi's amorphous indium nitride has been provided. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

9. Claims 1-5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Steffes et al, "New $\text{In}_x\text{O}_y\text{N}_z$ films for the application of NO_2 sensors," Sensors and Actuators B, Vol. 77, (2001), pages 352-358.

Art Unit: 1753

Steffes et al prepares indium oxynitride (see the entire document), which, it is the Examiner's position, has the claimed Seebeck coefficient and electrical resistivity, particularly in view of the fact the indium oxynitride is within the scope of formula (A) in instant claim 1. The indium oxynitride has very small grains of 10 to 30 nm (see abstract) and thus, it is the Examiner's position that Steffes et al's indium oxynitride can be considered to be amorphous. Since Steffes et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

In addition, the instant Seebeck coefficient and electrical resistivity would obviously have been present once Steffes et al indium oxynitride has been provided. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following journal articles are hereby made of record:

Yamaguchi et al, "Thermoelectric properties of $\text{Al}_{1-x}\text{In}_x\text{N}$ and $\text{Al}_{1-y-z}\text{Ga}_y\text{In}_z\text{N}$ prepared by radio-frequency sputtering: toward a thermoelectric power device," Applied Physics Letters, 82(13), pages 2065-2067, March 31, 2003. The articles has the same authorship as the instant inventive entity.

Yamaguchi et al, "Thermal diffusivity and thermoelectric figure of merit of $\text{Al}_{10x}\text{In}_x\text{N}$ prepared by reactive radio-frequency sputtering," Applied Physics Letters, 83(26), pages 5398-5400, December 29, 2003.

Art Unit: 1753

Yamaguchi et al, "Thermoelectric devices using InN and $\text{Al}_{1-x}\text{In}_x\text{N}$ thin films prepared by reactive radio-frequency sputtering," 84(26), pages 5344-5346, June 28, 2004.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
April 12, 2006

A handwritten signature in black ink, appearing to read 'alD' followed by a horizontal line and a vertical stroke.